

My Garden App Instructor Guide

Authors:

- Alyssa Rusk, Danny Yu, Eva Yap, and Sunil Mann of Applied Sciences (APSC) Outreach at Simon Fraser University



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Activity Summary

During this workshop series, participants will learn about the plants around them, especially those most beneficial to pollinators. Working individually, the participants will build a mobile app to record the plants nearby and rate how good they are for pollinators. The goal is to educate participants about the importance of pollinator friendly plants and encourage interests in conservation and sustainability. To build the app, participants will use the drag-and-drop app builder, [Thunkable](#). Participants will also explore the possibility of integrating technology to support conservation efforts and improve crucial STEM skills such as creativity, problem solving and critical thinking.

Audience

This workshop series is ideal for participants aged 8 to 12 years old. We typically have 10-12 students in an online class with three instructors.

Duration

Five 1.5 hour online workshops over video conferencing. See Appendix for an example of a past program schedule (Table A.1).

Workshop requirements

Basic requirements

- Internet access
- Laptop/Desktop computer
- Thunkable account: You can sign up here <https://thunkable.com/#/>
- System requirements:
 - <https://appinventor.mit.edu/explore/content/system-requirements.html>
 - The system requirements for Thunkable are not listed on its website. Since Thunkable is developed by the same research group that developed App Inventor, let's refer to the system requirements of App Inventor.
 - Web browser: Use this link to check your browser version <https://www.whatismybrowser.com/>
- Wireframe templates (see PDF attached and Appendix) and writing utensils:
 - If you have access to a printer, please remember to print at least two sheets of the wireframe template.
 - Alternatively, you could use two sheets of blank papers to draw your wireframes.
 - Please remember to bring your writing utensils. A pencil and an eraser would be preferred over using a pen (it's less messy if you make mistakes).

Optional

Mobile device or tablet with the Thunkable Live app installed. The Thunkable Live app is free.

- [Play store](#)
- [Apple store](#)

Safety Considerations

We ask participants to adhere to the faculty's virtual community guideline (see Appendix).

Learning Objectives

By the end of this workshop series, students will be able to:

- Explain basic coding concepts such as variables, conditions, loops, and databases.
- Apply basic coding concepts to build a mobile app using Thunkable.
- Identify plants that are good for attracting pollinators.
- Recognize that technology can be used to promote social change through educating and raising awareness about pollinator conservation.

Instructor Preparation

Before you start, build the My Garden App using the Thunkable Tutorial provided and go through the Ideation slide deck. This will help you make better sense of this instructor guide.

Overview of My Garden App

The purpose of this app is to help users keep track of plants near their area. This could be their own garden, a community garden, or a garden at their school. The app will also allow users to rate how good the plants are for local pollinators, which will educate and raise awareness about the need for pollinator conservation.

App Wireframes

See PDF attached for full size wireframes.

Project Name: My Garden App Date: _____

Screen Name: Home Screen

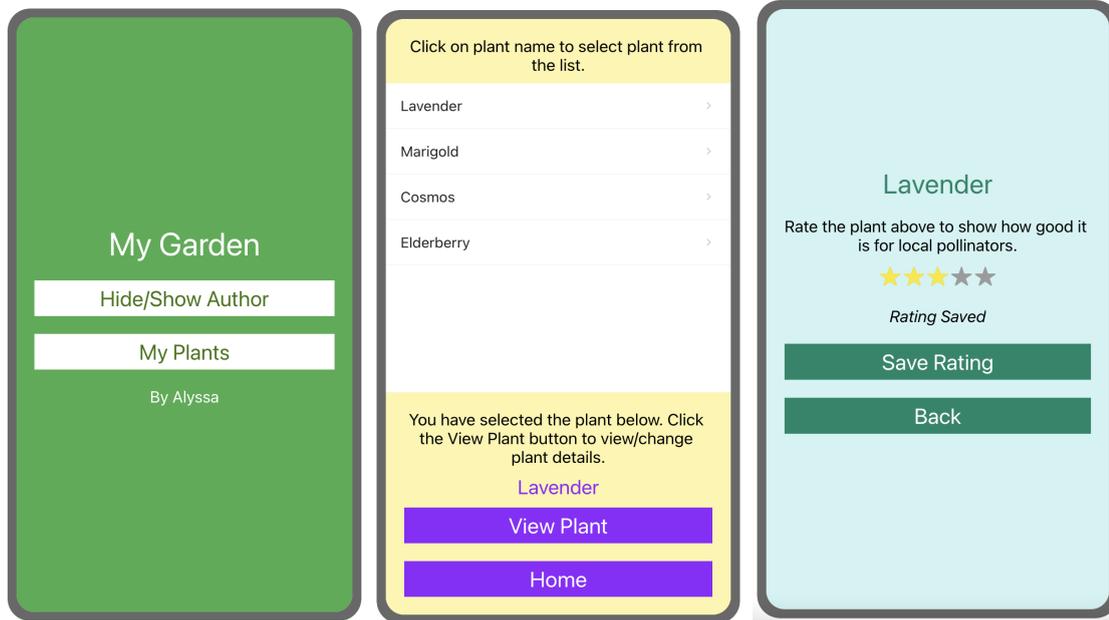
Project Name: My Garden App Date: _____

Screen Name: My Plants

Project Name: My Garden App Date: _____

Screen Name: Selected Plant Screen

Screenshot of App Screens



Thunkable Project Link

Project link: <https://x.thunkable.com/copy/d6efe27868219d2f7b350322bba0329b>

The share link will expire at 11:07 AM (PDT) Oct 11, 2021.

Video of App Demo

Link: <https://youtu.be/t7T6AIF4k2g>

Activity Procedure

To Do in Advance

- Send workshop details and requirements at least a week in advance to participants.
- Make sure that participants have working computers and stable internet connection.
- Make sure participants have at least two copies of the wireframe templates or blank paper and writing utensils.
- Ensure participants have a Thunkable account and are signed in.

Day 1: Ideation and App Planning

Required Materials

Ideation slides. This should be included with this instructor guide.

Welcome and Icebreaker

- Welcome students and present land acknowledgement.
- Go over how to use Zoom or the video-conferencing tool you're using.
- Play a quick 10-15 minute icebreaker to make sure everyone is ready for the workshop. There is a pollination related quiz that you can use in the slide deck as an icebreaker.
- Go over community guidelines. If you have the time, you can also co-create the community guidelines with your students.
- Give an overview of the program.
- Give an overview of today's workshop (i.e. Ideation/App Planning workshop).

Using the Ideation slide deck

Go through the Ideation slides with your students to cover the following content. The goals of this workshop are to 1) introduce students to the purpose of the My Garden App, 2) teach students how to plan their app design through drawing wireframes (a.k.a. paper prototypes).

What is an app?

- Really quickly introduce what are applications
- Highlight that this program focuses on mobile apps
- You can ask students to name a few apps they know and/or use.

Mobile apps for social change

- Technology could also be leveraged to promote social change.
- What are some examples of apps for social change? Here are some [examples](#).

The importance of pollinator conservation

- Present the purpose of the My Garden App, why pollinator conservation is important, and how can an app like this contribute to such efforts.
- Introduce the relationship between pollinators and plants.
- Introduce the importance of pollination.
- Highlight the decline of certain pollinators such as bees and how this can impact our lives.
- The good news is that there are things we can do such as creating pollinator friendly gardens.

What flowers are good for pollinators?

- After you present the characteristics of flowering plants that bees prefer, probe your students' knowledge on what flowers are good for bees.
- You can ask them to type into the chat or unmute themselves and let everyone know.

App Planning and Drawing Wireframes

- Next, you want to explain why it's important to plan your app design before building the app. This is something professionals in this area do. It's a more efficient way of developing an app v.s. just jumping into building your app and realizing that there are things you did not account for.
- Go over Step 0-3 of the app planning process.
 - Step 0: Name and concept
 - Step 1: App logic and project plan
 - Step 2: Drawing your wireframes
 - Step 3: Coding the app
- Go over the Step 0-2 of the app planning process for the three screens of the My Garden App. Give students time to draw their wireframes.
- Summarize the three screens and let students know that they will be building these screens together in the next three workshops.

Housekeeping items

- Go over how to split screen so students can view the instructor's screen and their screen simultaneously.
- Remind students to bring their wireframes to the next workshop.
- If you have time, you can give a quick Thinkable demo.

Day 2: Thinkable 1.0

Required Materials

- All participants must be logged into their Thinkable accounts.
- Make sure all participants are on a split screen view (i.e. they can see the instructor's screen and their screen side-by-side) unless they have a dual-monitor setup.
- Make sure they have their wireframes with them.

Welcome and Icebreaker

- Welcome students and present land acknowledgement.
- Play a quick 10-15 minute icebreaker to make sure everyone is ready for the workshop.
- Give an overview of today's workshop.

Introduction to Thinkable

- Give your students a quick Thinkable tour.
- Show students how to create a project. Make sure they uncheck the Drag and Drop Interface option. This is very important because we want students to focus on code vs. spending too much time designing and editing the design of their apps. The My Garden App tutorial is also not based on the Drag and Drop Interface.
- Introduce students to the Thinkable interface. Point out things like the design tab, blocks tab, project components, properties/attributes etc.

Coding Activity

The pace of the class really depends on the coding experience of your students. We recommend going over the following steps in the Thinkable 1.0 workshop. Please refer to the My Garden App Thinkable Tutorial. You should have already gone through the tutorial and built the app before this workshop.

- Create Home Screen.
- Add title label to Home Screen
- Add Author Appear Button
- Add Author Label
- Hide/show author name when Author Appear Button is clicked
- Add My Plants Button
- Add My Plants Screen
- Add Home Button
- Navigate to My Plants Screen when My Plants Button is clicked

Notes about the Coding Activity

- Remember to give your students time to tinker. It's important that they aren't just following your instructions but also actively exploring how Thinkable works and including their own ideas into their apps.
- Anticipate questions from your students and the need to troubleshoot bugs. If you have more than one instructor, you can split students up into breakout rooms. Otherwise, asking the student to share their screen and going through the student's problem would usually fix the issue.
- During your instruction, you will have to explain some coding concepts (see Glossary).
- Don't worry about not finishing the suggested steps under the Coding Activity section. You can always continue in the next workshop or change the scope of the project (e.g. not doing the Add Plant Screen).

Housekeeping Items

- Ask students to share their project links with you.
- Using these links, you can review your students' projects to ensure that they're on track.
- Remind students to bring their wireframes for the workshop tomorrow.

Day 3: Thunkable 2.0

Required Materials

- All participants must be logged into their Thunkable accounts.
- Make sure all participants are on a split screen view (i.e. they can see the instructor's screen and their screen side-by-side) unless they have a dual-monitor setup.
- Make sure they have their wireframes with them.

Welcome and Icebreaker

- Welcome students and present land acknowledgement.
- Play a quick 10-15 minute icebreaker to make sure everyone is ready for the workshop.
- Give an overview of today's workshop.

Coding Activity

The pace of the class really depends on the coding experience of your students. We recommend going over the following steps in the Thunkable 2.0 workshop. Please refer to the My Garden App Thunkable Tutorial. You should have already gone through the tutorial and built the app before this workshop.

- Add list component to My Plants Screen
- Add plants to list component using code
- Add Plant Name Label
- Change label text to the selected plant name
- Add View Plant Button
- Add instructions
- Hide label and button when My Plants Screen open
- Add local DB to project components
- Load Plant List variable from the Plant DB

Notes about the Coding Activity

- Remember to give your students time to tinker. It's important that they aren't just following your instructions but also actively exploring how Thunkable works and including their own ideas into their apps.
- Anticipate questions from your students and the need to troubleshoot bugs. If you have more than one instructor, you can split students up into breakout rooms. Otherwise, asking the student to share their screen and going through the student's problem would usually fix the issue.
- During your instruction, you will have to explain some coding concepts (see Glossary).
- Don't worry about not finishing the suggested steps under the Coding Activity section. You can always continue in the next workshop or change the scope of the project (e.g. not doing the Add Plant Screen).

Housekeeping Items

- Ask students to share their project links with you.
- Using these links, you can review your students' projects to ensure that they're on track.
- Remind students to bring their wireframes for the workshop tomorrow.

Day 4: Thunkable 3.0

Required Materials

- All participants must be logged into their Thunkable accounts.
- Make sure all participants are on a split screen view (i.e. they can see the instructor's screen and their screen side-by-side) unless they have a dual-monitor setup.
- Make sure they have their wireframes with them.

Welcome and Icebreaker

- Welcome students and present land acknowledgement.
- Play a quick 10-15 minute icebreaker to make sure everyone is ready for the workshop.
- Give an overview of today's workshop.

Coding Activity

The pace of the class really depends on the coding experience of your students. We recommend going over the following steps in the Thunkable 3.0 workshop. Please refer to the My Garden App Thunkable Tutorial. You should have already gone through the tutorial and built the app before this workshop.

- Add Selected Plant Screen
- Add Selected Plant Label
- Save plant ratings
- Add Saved/Unsaved Rating Label
- Add Plant Screen (if time permits)

Notes about the Coding Activity

- Remember to give your students time to tinker. It's important that they aren't just following your instructions but also actively exploring how Thunkable works and including their own ideas into their apps.
- Anticipate questions from your students and the need to troubleshoot bugs. If you have more than one instructor, you can split students up into breakout rooms. Otherwise, asking the student to share their screen and going through the student's problem would usually fix the issue.
- During your instruction, you will have to explain some coding concepts (see Glossary).
- Don't worry about not finishing the suggested steps under the Coding Activity section. You can always continue in the next workshop or change the scope of the project (e.g. not doing the Add Plant Screen).

Housekeeping Items

- Ask students to share their project links with you.
- Using these links, you can review your students' projects to ensure that they're on track.
- Remind students to bring their wireframes for the workshop tomorrow.

Day 5: App Demo

Welcome and Games

- Welcome students and present land acknowledgement.
- Presenting your work can be nerve-wrecking! This is particularly difficult in a virtual setting with people you don't know in the class.
- Play a few games with your students. We recommend games like [Skribbl.io](https://skribbl.io), a [Kahoot](https://kahoot.com) to review what they learned, a virtual escape room, or virtual mafia.
- You can spend more time playing games as this sets the tone for the presentations later on.

Show-and-tell Time

- As an instructor, you will present your app to the class first. You will include the following in your app demo.
 - Introduce yourself.
 - Share your screen to show your app.
 - Walk through how your app works.
 - Show one thing you add to your app that was not covered in the workshops. Note that this is optional for the students.
- Next, you can ask who wants to go next?
- If you have extra time at the end, you could do an instructor hot seat.
 - We give students 1 minute to type their questions in the chat but not hit Enter.
 - When the 2 minute timer starts, ask students to hit Enter to their questions.
 - Each instructor has 2 minutes to answer as many questions as they can.

Housekeeping Items

- Make sure students fill out an end-of-program survey.
- Thank them for participating in this workshop series and to continue coding and being creative!

Reflection & Debrief

If time permits, instructors can discuss the following with their students.

- Which plant did the participants add?
- Why are pollinators important?
- What is the importance of pollinator friendly gardens?
- How can we use these types of apps for conservation and sustainability efforts?

Activity Extensions

There are several extensions to this activity. Here are a few suggestions.

- Add a screen that allows users to add new plants to the database (see Add Plant Screen in the My Garden App Thinkable Tutorial).
- Add features to enable users to record the quantity of the different plants.
- Add features to allow users to track when they water their plants and receive a notification to remind them.
- Add features to enable users to store plant info on multiple gardens.
- Add features so that users can record the location of their gardens on Google Maps.
- Include categories of plants. The plants could be categorized by season (e.g. spring plants, winter plants, or year-round plants).
- Include more details about the plants (e.g. what pollinators do they typically attract).

Activity Modifications

The beauty of Thinkable is that you can share project links with others. This workshop can be condensed into a single 1.5 hour workshop if you preload all screens and their components and only teach students how to include code to build the app. You may need to cut down on some features on top of preloading the screens and their components.

Glossary

- **Variable:** A container to store things. These things can be strings, numbers, lists etc.
- **Conditions:** Statements that tell a program to do different things based on whether the condition is true or false.
- **Loops** repeat code until a specific condition is met.
- **Functions** are code that can be used over and over again.
- **Database** is data stored in a structured/organized manner.
- **Index:** In Thinkable, an index points to a row number within a database.

Appendix

Table A.1: An example of a past program schedule.

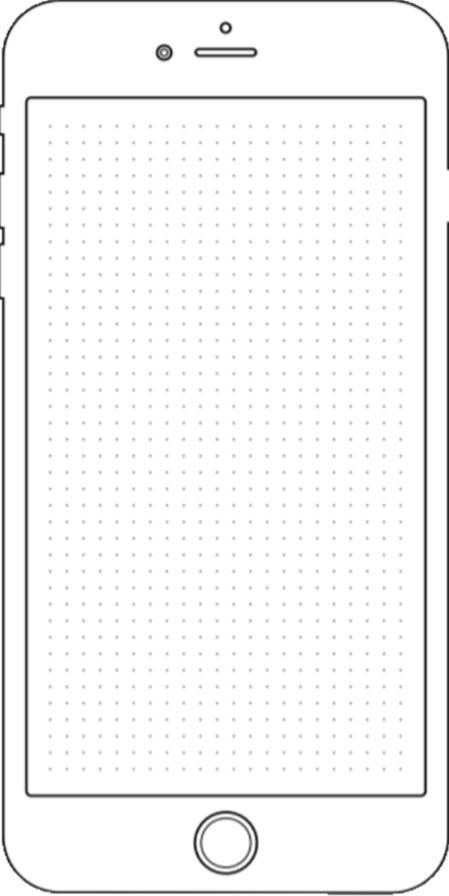
Session	Workshop	Content
Aug 9, 2021 (Mon) 1:00-2:30 pm	Ideation	After attending the Ideation workshop, students will be able to plan their app design by creating paper prototypes.
Aug 10, 2021 (Tues) 1:00-2:30 pm	Thunkable 1.0	Our Thunkable workshops will cover the following: <ul style="list-style-type: none"> ● Introduction to the Thunkable interface ● Variables ● Functions ● Conditions ● Loops ● Database (read/write) The progress of covering the concepts above will depend on the pace of the class.
Aug 11, 2021 (Wed) 1:00-2:30 pm	Thunkable 2.0	
Aug 12, 2021 (Thurs) 1:00-2:30 pm	Thunkable 3.0	
Aug 13, 2021 (Fri) 1:00-2:30 pm	Show-and-tell	Students will be given the opportunity to present their apps to the class and celebrate their work!

Doc. 1: Wireframe template

Image of the wireframe template provided to students. The PDF copy is attached with the email.

Project Name: _____ Date: _____

Screen Name: _____



The image shows a wireframe template for a smartphone screen. It consists of a rectangular frame with rounded corners, representing the phone's body. At the top, there are two small circles and a horizontal line, representing the earpiece and front camera. At the bottom, there is a circular home button. The main area of the screen is filled with a grid of small dots, representing a wireframe for content layout.

Doc. 2: Virtual Community Guidelines

Welcome to the App Dev Summer Camp offered virtually by the SFU Applied Sciences Outreach! We are so excited that you have decided to join us. Our mission is to inspire, encourage, and support youths of all backgrounds to explore the many topics related to science, engineering, and technology through interactive and engaging activities. Before you join us, there are some guidelines we need everyone to follow to maintain the safety of everyone involved. See below for our Virtual Community Guidelines.

Personal Safety: We take safety seriously. If harm is disclosed or discussed (harm to self, or harming others) then we will take the appropriate steps to ensure your continued safety and the safety of those around you. Threats about others personal safety will not be tolerated.

Respect: Treat those online as you would treat them in-person that is with respect, dignity, and care.

No Hate Speech or Bullying: Bullying, discrimination, and harassment of any kind will not be tolerated.

Communication: Communication is encouraged in this workshop. Communicate with respect and listen to others when they speak or share ideas, which includes when sharing ideas out loud or via the chat function. Mute your microphone when not speaking and only turn your video on if you feel comfortable to do so.

Privacy: Respect the privacy and personal information of those in the shared virtual space by not sharing information that is not your own. Respect your own privacy by not sharing any personal information with those you do not know. Sharing of the Zoom link with those outside of the specific intended group is strictly prohibited.

Copyright: There will be no recording of anything that happens in this space, which includes participants and instructors taking pictures, recording parts of the workshop or recording their screen during any part of the workshop.

By joining the App Dev Summer Camp, you are considered to be in agreement with the above community guidelines. We will take the appropriate actions if any of the above guidelines are violated. Depending on the situation, this may result in revoking participation in the remaining workshops. Thank you in advance for your commitment for keeping our programs engaging, safe and of course, fun!